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**Close Support Field Artillery and
the Challenge of AirLand Battle-Future**

**A Monograph
by
Major Thomas W. Weafer
Field Artillery**



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ABSTRACT

CLOSE SUPPORT FIELD ARTILLERY AND THE CHALLENGE OF AIRLAND BATTLE-FUTURE by Major Thomas W. Weafer, USA, 52 pages.

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Table of Contents

	Page
I. Introduction	1
II. Current Field Artillery Doctrine	4
III. Historical Analysis	10
IV. AirLand Battle and the Field Artillery	16
V. The Challenge of AirLand Battle-Future (ALBF).	19
VI. Conclusions and Implications	36
Appendix A. Field Artillery Tactical Missions	41
Endnotes	42
Bibliography	48

INTRODUCTION

Throughout the history of modern warfare, artillery has been a major component of the combat power equation. Napoleon attached great importance to the firepower of his artillery, noting that "Great battles are won by artillery"¹ and that "Fire is everything; the rest does not matter."² Similarly, the theorist Carl von Clausewitz wrote that "Artillery increases the destructive principle of fire; it is the most redoubtable of arms."³ And J.F.C. Fuller, after witnessing the awesome firepower of the artillery in World War I, wrote that "Artillery conquers and infantry occupies."⁴

During its relatively short history, the U.S. Army's field artillery has provided superb fire support on our nation's battlefields. From Braxton Bragg's decisive use of his "flying battery" at Buena Vista in the Mexican War to the annihilating fire of the massed Union artillery at Malvern Hill, U.S. artillery has developed a tradition of superb close fire support. Indeed, shortly before his death after World War II, General George S. Patton commented "I do not have to tell you who won the war. You know. The artillery did."⁵

While firepower may have dominated during the attrition oriented warfare of World War II, the challenges of the modern battlefield call for a more synergistic mix of firepower and maneuver. Jomini wrote

that one of the greatest challenges facing a commander was the "simultaneous employment of the largest number of troops of all arms combined...at the critical moment of the battle."⁶ He realized that a combined arms approach to battle was necessary if one was to obey "the only fundamental rule"⁷ of employing the three combat arms so that they give each other "mutual support and assistance."⁸

Field Manual 100-5, Operations more specifically defines superior combat power as the synergistic effect of combining maneuver, firepower, protection and leadership in combat actions against an enemy.⁹ But achieving the synchronization necessary to result in the generation of superior combat power is no easy task. Indeed, the field artillery in recent years has been criticized for its inability to provide adequate close fires in support of the more maneuver oriented AirLand Battle doctrine.¹⁰ Results from the National Training Center show that the field artillery frequently fails to be integrated as an effective member of the combined arms team. Additionally, some notable maneuver commanders have called upon the field artillery to make radical changes in order to provide better close support to maneuver on the more fluid modern battlefield.¹¹

Now the field artillery faces an even greater close support challenge in the form of the emerging AirLand Battle Future (ALBF) concept. The nature of the ALBF battlefield dictates that close artillery support to the

maneuver brigade will be both more crucial and more difficult. Close support field artillery battalions will operate in a nonlinear environment at a high tempo with long lines of supply while providing even more responsive and synchronized fire support than currently necessary. Emerging technology, in the form of "fire-and-forget" "brilliant" munitions, will give the artillery new and more lethal capabilities which will test the adequacy of current artillery employment doctrine.

The ALBF concept also shifts the focus downward from division to the combined arms brigade as the lowest level of independent self-sustaining tactical maneuver. Such a change begs the question of whether the supporting artillery battalion should have a support or command relationship with its habitually associated brigade. The concept itself leaves the question largely unanswered by loosely describing the relationship as a murky "somewhat closer than DS."

The significant challenges of operating in a fast moving nonlinear environment as well as the potential of new munitions and the ill-defined artillery-maneuver support relationship imply a possible redefinition of the way in which close fire support is provided. This monograph will therefore seek to answer some of the key questions with regard to how the field artillery should best be organized and doctrinally employed to provide close support to the heavy maneuver brigade on the high intensity ALBF battlefield.

Field Manual 100-5 says that the three most important considerations in integrating fire support into operations are adequacy, continuity and flexibility. Adequacy is primarily an issue of responsiveness and mass. Continuity of close support depends upon the mobility, range and depth of artillery assets and on the supply of artillery ammunition. Flexibility is achieved by maintaining both a degree of centralized control and the proper mix of artillery systems at each echelon with which the commander can influence the action.¹³ This paper will examine history, current doctrine, and the ALBF concept using these three tenets of fire support as tools for analysis in attempting to anticipate what changes the field artillery will have to make in order to provide close support on the future battlefield.

CURRENT FIELD ARTILLERY DOCTRINE

Field Manual 6-20, Fire Support in the Airland Battle, provides the doctrinal guidance which defines field artillery roles, command and support relationships and the fundamentals of organizing field artillery units for combat. This guidance provides a method of allocating scarce artillery assets based on the factors of METT-T, which strikes a balance between responsive fires for the maneuver forces and the centralization necessary to mass fires when necessary. This balance is achieved by assigning artillery units standard tactical missions based on the doctrinal

fundamentals of organizing units for combat.

The assignment of a standard tactical mission establishes the relationship of a field artillery unit to a supported maneuver unit or another field artillery unit. Of the four possible missions, direct support (DS) and reinforcing (R) are the more responsive, decentralized missions, while general support reinforcing (GSR) and general support (GS) are more centralized and are less responsive. In addition, each of the four standard tactical missions carries with it a set of inherent responsibilities for the field artillery unit. For example, a battalion in direct support of a maneuver brigade is concerned primarily with the fire support needs of only that brigade. As part of its doctrinal DS responsibilities, the battalion answers calls for fire in first priority from its supported brigade and maintains a zone of fire to support it. The DS battalion commander also positions his unit and plans his own fires in coordination with the brigade and is required to maintain communications with it. However, as shown in the table at Appendix A, even though DS is the most decentralized mission, the battalion is still required to answer calls for fire from its higher artillery headquarters and may be positioned by that headquarters when necessary.¹⁴

Although they are poorly addressed in the latest version of FM 6-20, command relationships such as OPCON or attached may also be established for field artillery units.

When such a relationship is assigned, the supported maneuver commander has complete tactical control of the field artillery unit and has the important ability to assign missions to elements of the unit.

The force commander determines the proper mix of the different support and command relationships to both meet his own requirements and the needs of his subordinate units. The commander is guided in this process by the five fundamentals of organizing artillery for combat:

1. Adequate field artillery support for committed combat units.
2. Weight the main attack in the offense or the most vulnerable area in the defense.
3. Facilitate future operations.
4. Immediately available field artillery support with which the force commander can influence the action.
5. Maximum feasible centralized control.¹⁵

These guidelines, along with the factors of METT-T, help the commander to balance the demand for responsive close support fire against the need to centralize to preserve flexibility and the capability to mass fires. An examination of the fundamentals indicates that although they do provide adequate close support fires, they are heavily weighted toward preserving the centralized control necessary to mass fires at critical points on the battlefield.

In preparing to look at the close support role of the artillery on the future battlefield, it is important to define the three doctrinal support roles of the field

artillery: close support, counterfire, and interdiction. Close support fires are those immediately responsive fires that support the commander's scheme of maneuver. They are used to engage enemy troops, weapons or positions that threaten the force and provide the commander the ability to rapidly multiply his combat power effects by shifting fires quickly around the battlefield.¹⁵

On the other hand, counterfires attack enemy indirect fire means such as mortars, artillery, and rockets in order to preserve the freedom of action of the supported maneuver force. Counterfire targets also include enemy air defenses, observation posts, and artillery command and control facilities. Counterfire is doctrinally the responsibility of GS and GSR units, but it may be fired by any unit.¹⁷

Finally, interdiction fires disrupt, delay and destroy enemy forces not yet in contact. By targeting follow-on enemy forces, interdiction fires add depth to the battlefield and create "windows" for friendly offensive maneuver.¹⁸

In addition to discussing the three support roles of field artillery, current doctrine also describes its characteristics and capabilities. It notes that the field artillery is a system composed of weapons and munitions, target acquisition and surveillance assets, and a command, control and coordination network. This system provides the commander flexibility through a variety of cannon, rocket, and missile delivery means that fire a variety of munitions.

It also claims that field artillery units are as mobile as the units they support.¹⁹

At the same time, doctrine also acknowledges that field artillery units have limitations. Artillery units have a serious weakness in that they have only a limited self-defense capability against ground and air attack. Further, doctrine notes that the field artillery currently has only a limited capability to destroy armored, moving targets.²⁰

Although current field artillery doctrine purports to support maneuver in the Airland Battle, it contains surprisingly little guidance on support for deep offensive maneuver. In fact, while the old FM 6-20 urged techniques such as the dedicated battery, extreme decentralization, and other measures to increase responsiveness to offensive operations, newer manuals seem to take a more centralized approach.²¹ The new FM 6-20-40, Tactics, Techniques and Procedures for Fire Support for Brigade Operations (Heavy), drops the concept of the dedicated battery for a seemingly less responsive "quick fire" or "exclusive" observer net. It also drops references to the "extreme decentralization" recommended by the earlier manual.²²

Although FM 6-20-40 is a "how to" manual, it provides little guidance on how field artillery should physically provide fire support to deep maneuver operations. However, some guidance is found in the new maneuver manuals. FM 71-3, Armored and Mechanized Infantry Brigade, includes diagrams and some discussion about where field artillery

units position during offensive operations.²³

FM 71-100, Division Operations, specifically addresses field artillery support for deep maneuver. It briefly notes that while field artillery can accompany the deep maneuver force when required, it is preferable to have all supporting fires delivered from the friendly side of the FLOT. The manual goes on to say that by leaving its direct support artillery behind at the FLOT, the maneuver force maintains its mobility by reducing both its size and the tremendous logistical burden which artillery ammunition imposes.²⁴

Thus we see that current doctrine recognizes the difficulties that are inherent to close field artillery support of deep offensive operations. However, it fails to offer any detail about how those difficulties should be overcome. Instead, current field artillery doctrine supports a system that favors centralization of a fairly scarce asset in support of a relatively linear battlefield.

So where do we look for guidance in trying to anticipate what field artillery close support will be like on the future battlefield? In the absence of adequate doctrinal guidance on the subject it is appropriate to look to history as a source for ideas. Clausewitz said that "Historical examples help clarify everything"²⁵ and that "This is particularly true in the art of war."²⁶ Therefore, we will examine the fire support provided to the U.S. armored divisions in World War II for an example of the challenges of close support to deep, nonlinear operations.

HISTORICAL ANALYSIS

The primary role of the World War II armored division was exploitation of enemy rear areas. As such, the nature of armored actions required speed and flexibility in planning and action.²⁷ Field artillery support to the fast-moving armored divisions came in the form of specially trained armored field artillery (AFA) battalions. Each division was assigned two DS 105mm battalions and one GS 155mm battalion. Although equipped with the highly mobile M7 and M12 self-propelled howitzers, the fluidity and tempo of fast moving operations posed new and difficult challenges to the AFA battalions.

In order to provide responsive and continuous close support, batteries were forced to operate far forward in the march column, often from exposed positions. One battery, along with the battalion commander, would usually accompany a combat command's advance guard, placing it within 2000-3000 yards from the head of the advancing column.²⁸ From this position it was able to provide quick and accurate fire to reduce obstacles and strongpoints or provide screening smoke in order to enable the column to bypass enemy centers of resistance and maintain the tempo of the advance.²⁹ During especially fast moving situations, firing batteries were "stripped" of nonessential vehicles and only the six howitzers and the fire direction center would move forward to provide more mobile support.³⁰ Missions were frequently

conducted as "hipshoots" as units saved time by simply pulling off to the side of the road to conduct firing.³¹

Support for deep armored thrusts subjected AFA battalions to a considerable amount of risk. Units were frequently forced into enemy territory in order to secure firing positions from which they could deliver continuous fire support to the attack.³² Indeed, the 94th AFA of the 4th Armored Division frequently fought as infantry and captured 12 towns without assistance during the division's drive across France and Germany. The unit's memoirs note that after once attacking 90 miles in 12 hours, the battalion took up an all-around defense because, "as usual, there were no other troops on our flanks."³³

Brisk small arms firefights in defense of battery perimeters were a normal occurrence and AFA batteries were sometimes called upon to fend off both armored and infantry attacks without assistance.³⁴ High explosive antitank ammunition also gave the armored artillery a valuable direct fire weapon in countering enemy tanks.³⁵ The capability for self defense of the AFA units was critical to the success of the armored division offensive. In the several instances when towed artillery was placed in DS to armored columns, its lack of self reliance was a serious handicap to the attacking force.³⁶

The artillery's organic Piper Cub observation aircraft proved to be not only a superb target acquisition asset but was also an invaluable source of intelligence to rapidly

advancing armor columns. Each artillery headquarters had two of the 800 pound unarmed planes. Commanders took extraordinary measures to keep these air observation posts flying in order to have real-time information on possible targets or obstructions to their advance.³⁷ In typical operations, the small planes were kept in the air from 12-16 hours a day at the head of each lead task force.³⁸ After the war, the Chief of Field Artillery commented that the Piper Cub made "One of the greatest contributions to the effectiveness of artillery fire."³⁹

Difficulties in the resupply of artillery ammunition proved to be a limiting factor in deep offensive operations. Supply lines that were sometimes over 200 miles long put a terrific strain on the system.⁴⁰

Additionally, supply convoys had to be armed as they frequently had to fight their way through bypassed enemy resistance.⁴¹ Always faced with the possibility of being cut off for two or three days from resupply, units tried to maintain an extra "rolling reserve" of ammunition. However, lack of sufficient organic transport meant that ammunition resupply was almost always inadequate.⁴²

Decentralized control of artillery was key to providing adequate, continuous, and flexible fire support to rapidly advancing units. Division artillery (DIVARTY) commanders refrained from attaching out battalions and instead preserved their option to mass fires, when possible, by placing battalions in DS of the combat commands. DS

battalion commanders were then given latitude in determining their own positioning.⁴³ When distance made DIVARTY control infeasible, or when columns diverged out of mutually supporting artillery range, DS battalions were attached to the combat commands.⁴⁴

Corps commanders gradually decentralized their field artillery assets as exploitation into operational depths continued. Corps 105mm and 155mm self-propelled battalions were normally attached or placed OPCON to the armored DIVARTYs as they were the only units possessing the requisite mobility to support the armored advance.⁴⁵ In supporting the attack, corps artillery left the close fight to the DIVARTYs and primarily concerned itself with the counterfire battle.⁴⁶ However, even the corps artillery groups that remained in GS and GSR achieved a "de facto" decentralization by violating doctrine as the situation dictated by displacing their battalions forward without corps approval.⁴⁷

To provide close support, DIVARTY commanders used their augmentation from corps to form groupments of 2-3 battalions each which were placed in DS of each combat command.⁴⁸ Regardless of seniority, the DS battalion commander was placed in command of the groupment to capitalize on the efficiency generated by his habitual support relationship with the combat command. DIVARTY usually retained one 155mm battalion in GS to maintain the flexibility to mass fires, but its primary mission in fluid situations was the

clearance and coordination of fires.⁴⁹

Close artillery support to the fast moving armored divisions obviously required a different breed of aggressive and self-reliant artillerymen. As one commander put it, "Close support becomes a real thing indeed when all hands know that nothing--enemy infantry, tanks or shell fire can stop an armored artillery firing battery."⁵⁰

A 1950 report from the Armored School stated the case even better. It described the armored artillery as a "state of mind" in which

...Its aggressive spirit for forward movement and contact with the enemy makes it almost a different arm, for it must exhibit the same characteristics of firepower, mobility, and shock action expected of the other members of the combined arms team....These capabilities are not the result of special equipment alone but must be the result of aggressive thought and action on the part of its commanders.⁵¹

Thus we see that the armored artillery battalion was indeed a true fighting unit. It stands somewhat in contrast to the field artillery battalion of today which doctrine warns has only a limited self-defense capability against ground and air attack.

Before moving on to look at current artillery, it is important to recap the lessons learned from our brief look at history. First, even though AFA units were equipped with howitzers that were as mobile as the tanks they supported, they still had difficulty providing continuous support to a rapidly moving advance. Because responsive fires were necessary to maintain the momentum of the attack, artillery

units were forced to stay near the head of the march column, often in exposed positions. Second, unlike today's artillery units, AFA battalions were well prepared to fight as infantry. Their ability to use both direct and indirect fire was crucial to the adequacy of the close support they provided. Third, the organic target acquisition capability provided to the armored force by the artillery's Piper Cub proved to be invaluable in both targeting indirect fires and providing intelligence vital in maintaining a rapid advance. It is unfortunate that no such organic asset exists today.

Fourth, control of artillery from corps on down was extremely decentralized during deep offensive armored thrusts. Commanders at all levels attempted to retain flexibility by maintaining support relationships as long as possible. However, rapid advances frequently led to attachment of artillery to supported units. Also of note was the fact that corps artillery picked up the heavy burden of the counterfire battle, allowing the DIVARTY to concentrate on close support.

Fifth, as is the case today, ammunition resupply was a limiting factor in providing adequate and continuous support. With good reason FM 71-100 cautions the maneuver commander about taking accompanying artillery in cross-FLOT operations. Resupply of artillery ammunition during a rapid advance in a nonlinear environment is extremely difficult.

Finally, we note that armored artillerymen were much more closely wedded to their maneuver brethren than are

today's DS artillerymen. By identifying themselves with the "fire and dash of armored action" they saw themselves as an integral part of the fighting team and thereby developed a great will to fight.⁵²

AIRLAND BATTLE AND THE FIELD ARTILLERY

Although FM 100-5 describes both linear and nonlinear operations, the NATO focused AirLand Battle doctrine, influenced by political restrictions, has retained a relatively linear orientation.⁵³ Indeed, the 1988 version of FM 6-20 notes, "The development of AirLand Battle as the Army fighting doctrine does not pose any revolutionary challenges for the fire support system."⁵⁴ However, the manual goes on to note that AirLand Battle does reestablish the need "to increase the scope of fire support to an operational level that has not existed since the Second World War."⁵⁵

Thus, doctrine recognized a change in scope in AirLand Battle from the division to the corps artillery for the accomplishment of the fire support tasks. However, in actuality, little of the burden of these fire support tasks was really moved away from the division level. DIVARTY retained not only its traditional close support role but also the counterfire role which had been pushed down to it during the doctrine of Active Defense.⁵⁶

Organizational changes initiated in the mid-1970's continued through the 1980's. Corps artillery target

acquisition battalions were broken up and each DIVARTY received a target acquisition battery. DIVARTY lost its eight inch howitzer battalion which had traditionally been used in a close support reinforcing role and instead received a multiple launch rocket system (MLRS) battery to conduct the counterfire and deep battles.

While close support doctrinally remained the primary fire support role of division artillery, DIVARTY commanders were overwhelmed in an effort to conduct a plethora of close support, SEAD, counterfire, and division deep missions. In addition, the fielding of TACFIRE caused a trend toward centralization of control of artillery and sometimes degraded the close support role. During high volume periods, FIREFINDER radar inputs would often back up TACFIRE mission processing for several minutes, thus degrading close support response time.⁵⁷ In general, division level artillerymen were becoming more focused on the technical side of servicing an overwhelming amount of various types of targets at the expense of the close support role.

By the mid-eighties, the poor quality of field artillery close support became obvious at the National Training Center (NTC). In December 1986 the Vice Chief of Staff of the Army witnessed the poor performance of an artillery battalion which was characterized to him as not being unique to that unit. A letter to the Commandant of the Field Artillery School from the Commander of the Combined Arms Center on the subject virtually indicted the

field artillery for its inability to provide adequate close support.⁵⁸ Similarly, an after-action report published following a Center for Army Lessons Learned NTC focused rotation in 1988 commented that the synchronization of the fire support system into the battle "is broken."⁵⁹

Field artillery commanders soon realized that their near total concentration on technical proficiency in both nuclear and conventional gunnery had worked against providing synchronized fire support to their maneuver counterparts.⁶⁰ The entire branch made a conscious effort to improve the quality of fire support personnel and to refine doctrine to better integrate fires into the close fight. An effort was also made to better educate maneuver commanders in the employment of fire support assets.

However, many maneuver commanders began to criticize the artillery for its lack of ability to provide close support for high tempo maneuver warfare. Many saw the solution as the creation of organic close support battalions within the maneuver brigades to provide more responsive support. Field artillerymen continued to defend their need for centralization by arguing the merits of massed fires.⁶¹

One senior maneuver commander, General Crosbie E. Saint, challenged the field artillery to "break the bonds of traditional fire support methods and seek to perfect workable solutions for tomorrow's battlefield." Calling for direct support artillery much like that of the AFA battalions of World War II, Saint advocated the use of

"storm artillery" to act as a fire support "slingshot" in maintaining the momentum of the attack.⁶²

In General Saint's vision of "mobile armored warfare," artillery would travel behind the lead task forces of committed brigades and provide high volumes of fire 2000 meters to the front or flanks within fifteen seconds.⁶³ The mobility of the firing battery would be enhanced by stripping it of nonessential vehicles and units would frequently employ direct fire or hipshoots instead of occupying firing positions.⁶⁴

Although these ideas seem quite radical to today's artilleryman, they are amazingly reminiscent of the type of close support provided by the aggressive armored artilleryman of World War II. Indeed, as the Army moves toward the highly mobile style of warfare envisioned by the ALBF concept, the field artillery will have to make significant changes in its employment doctrine. Contrary to FM 6-20's characterization of AirLand Battle doctrine, ALBF will most certainly pose some "revolutionary challenges for the fire support system."⁶⁵

THE CHALLENGE OF AIRLAND BATTLE-FUTURE (ALBF)

One of the chief characteristics of the ALBF concept is the nonlinearity of the battlefield. While AirLand Battle doctrine envisions linear warfare that could become nonlinear, ALBF envisions a battlefield 5-15 years in the future on which forces are initially employed in nonlinear

operations.⁶⁶

Economic and geopolitical considerations dictate that smaller U.S. forces will be forced to operate on a greatly extended battlefield. Large gaps will exist when units concentrate and operations will be characterized by rapid and fluid maneuver which will be used to exploit highly lethal fires. Additionally, the nonlinear battlefield will place a premium on the offensive and the primary emphasis will be on the destruction of the enemy versus occupation of terrain.⁶⁷

The ALBF battlefield concept uses current and emerging technologies as combat multipliers to gain the advantage in a nonlinear environment.⁶⁸ Advanced air, ground and space based sensors will enable the commander to better "see the battlefield." Such sensors, combined with the verification of physical reconnaissance, will allow the commander to know the location of significant (battalion size or larger) enemy forces almost all of the time.⁶⁹

Advanced command and control decision aids will use artificial intelligence to help locate, track and target enemy formations. New long range munitions such as the Army Tactical Missile System (ATACMS) will then allow the commander to destroy and disrupt the enemy at operational depths. At the tactical level, new terminally guided projectiles such as SADARM (Sense and Destroy Armor) will give cannon and rocket field artillery a quantum increase in lethality. Finally, an automated and maneuverable "surge

type" logistics system will provide CSS through a push system at critical times and places on the battlefield.⁷⁰

All of these advanced technology systems will allow the future force to be both mobile and lethal while operating inside a relatively large battle area. The ALBF scenario envisions a Corps fight in a zone 600 kilometers deep by 300-400 kilometers across that progresses in four overlapping phases.⁷¹ In Stage I, the SENSOR/ACQUISITION phase, reconnaissance, intelligence, surveillance and target acquisition (RISTA) assets detect and target enemy forces. In Stage II, FIRES, the Corps commander uses all available fires to destroy enemy maneuver and fire support forces at extended ranges. Precision long range fires are the major killer in this phase and are designed to separate enemy formations in time and/or space and establish the conditions for friendly maneuver.⁷²

The MANEUVER phase is the decisive stage of the battle. Once the corps commander decides that the enemy forces have been attrited sufficiently by precision indirect fires, he will quickly tailor a maneuver force and commit it to destroy the enemy. The maneuver force will typically be one or more combined arms brigade packages operating under the tactical control of a division headquarters. This force will be extremely agile. It will move over 100 kilometers, fight, and return to a recovery location all within 24-40 hours.⁷³

Like the FIRES phase, indirect fire means are again key

to attriting the enemy in the MANEUVER phase. Close support artillery, possibly reinforced by corps units, will continue to fire upon enemy targets during the movement to contact. The maneuver commander will not attack until the enemy is so vulnerable that victory is assured. During the attack, artillery will also be called upon to provide suppressive fires and immediate smoke projection in support of maneuver.⁷⁴ In the final phase, RECOVERY, logistics resources "skip echelon" and flow directly from corps CSS assets to the maneuver brigades.

The combined arms brigade package is the basic building block of the ALBF operational planner. It is a self sustaining unit that comes with the command and control, fires, intelligence and logistics interfaces that enable it to join any division base organization. In order to enhance its agility, the brigade moves with an austere forward support battalion while the division is stripped of its administrative functions and is purely a tactical headquarters.

In this brief summary of the ALBF concept, it is obvious that indirect fires will play a primary role in combat operations. The ALBF Umbrella Concept states, "As the principle ingredient for disrupting and destroying the enemy's momentum, indirect fire provides the lens for focusing the application of combat power."⁷⁵ Clearly, close support artillery has a crucial role to play in shaping the battlefield and setting the terms for maneuver

through firepower. How then will the field artillery fill this new role?

As noted earlier, current field artillery doctrine describes the fire support system in terms of three components: weapons, target acquisition and C3. Improvements in all of these areas will help the artillery to meet the challenges of ALBF. Indeed, theorist Richard Simpkin believes that

We are now at one of the peaks of theoretical speculation which presage radical change... the dominance of indirect fire achieved by surveillance and fire control on one hand, and by terminal guidance on the other.⁷⁶

Perhaps the most significant change within this triad will be the quantum leap in the effectiveness of field artillery weapons. The lethality of new terminally guided warheads (TGW's) will significantly increase the impact of artillery as a combat multiplier on the battlefield. Munitions such as the 155mm SADARM will employ dual infrared and millimeter wave seeking technology to enable it to search for and "top-attack" moving armored vehicles.⁷⁷ Additions to the MLRS family of munitions such as ATACMS, MLRS TGW and Ground Launched Tacit Rainbow (GLTR) will also help to redefine the killing power of artillery systems.⁷⁸

With the arrival of TGW's on the battlefield, armor will become vulnerable to relatively cheap munitions. Chris Bellamy believes that artillery TGW's will be the greatest threat to tanks in the future and that they will create the

most revolutionary change in war since the helicopter.⁷⁹

While current doctrine describes artillery as an area fire weapon, these new munitions will allow artillery to, in effect, become a direct indirect fire weapon. This new capability will obviate much of the current need to mass artillery fires. Since the massing requirement is a function of lethality, TGW's will enable single batteries to achieve target effects that would have required multiple battalions firing conventional munitions.⁸⁰

Since smart munitions will be able to do more of the tasks now accomplished by direct fire, more emphasis will be placed on target acquisition means. We have to assume that the enemy will also possess TGW's. Thus, counterfire will become a crucial issue in protecting the maneuver force. The Advanced Target Acquisition Counterfire (ATACS) radar will detect enemy artillery targets at long range using leap-ahead technology in the form of a passive emitter.⁸¹ Since many of these targets will be beyond the range of the brigade's close support 155mm artillery, either DIVARTY or corps artillery will have to provide missile assets to fight a longer range counterfire battle.

Just as the AFA battalions of World War II depended on their organic Piper Cubs for targeting information, close support artillery battalions will require high technology sensors to provide them with a real-time target acquisition means. While a ground station module (GSM) at DIVARTY will link the DS battalion to such higher level assets as JSTARS

and Guardrail, the battalion will also rely on the brigade's organic short range unmanned aerial vehicle (UAV) for real-time targeting and intelligence information.⁸²

Finally, future C3 requirements will be met by the Advanced Field Artillery Tactical Data System (AFATDS) which will automate artillery C2, tactical fire control and sustainment functions. AFATDS will also provide the link between firing systems and sensors reducing the time necessary for the decide-detect-deliver cycle to take place. Responsiveness at the delivery level will be improved by the M109A6 "HIP" (Howitzer Improvement Program) howitzer which will have the ability to rapidly emplace, self locate and autonomously process and shoot fire missions.

However, even with all these improvements, the field artillery will still face enormous challenges in the areas of mobility, self defense, and ammunition resupply. Although current doctrine describes the artillery as being as mobile as the force it supports, the M109 howitzer lags behind its M1 and M2 maneuver counterparts. The future HIP howitzer is merely a product improvement of the original M109 built 27 years ago. Although its range is improved to 30 kilometers, the HIP is twice as heavy as the original M109 and has a top speed of only 34 MPH.⁸³

Just as the AFA units in World War II used innovation to keep up with their supported forces, HIP batteries will have to do the same. The ALBF concept stipulates that maneuver units will still require artillery delivered smoke

and suppressive fires.⁸⁴ In order to be in position to deliver these fires, batteries may have to leapfrog by platoon to insure that at least four howitzers are always forward in the march column to provide responsive support. Additionally, batteries may have to strip themselves of nonessential vehicles in order to enhance their poor mobility.

FM 6-20 also notes that one of the limitations of the artillery is its poor self defense capability. However, history shows that artillery units involved in deep offensive operations are frequently forced to engage enemy maneuver elements. Although the HIP is protected with Kevlar lining, it is vulnerable to any enemy force, especially tanks. Even though the howitzer does have an improved direct fire telescope, the artillery currently lacks a 155mm antitank round and is poorly trained in direct fire techniques.

A 1975 study by the Field Artillery school indicated a requirement for a 155mm HEAT round. Indeed, both the Israelis and the Soviets train extensively on direct fire and use it to improve responsiveness, save ammunition and provide a self defense capability. It seems imperative that the U.S. should develop a HEAT round and improve field artillery crew proficiency in direct fire procedures if cannon artillery is to be effective and survivable on the ALBF battlefield.

Just as it has always been, artillery ammunition

resupply will continue to be a limiting factor in ALBF. Since the artillery uses 80% of ammunition tonnage, ammunition resupply has always been its Achilles heel.⁸⁵ And the lesson learned in every modern war is that peacetime estimates of ammunition consumption are vastly understated.⁸⁶ Although ALBF brigades will move fast and minimize direct combat, they will depend on artillery to not only destroy the enemy with longer range fires but also to provide suppressive fires and obscuration. Also, sensor systems will provide a plethora of targets which the HIP, with its high rate of fire, could engage if it has the ammunition.

Although the concept calls for CSS to sustain the maneuver forces momentum during the maneuver phase, it is probably unrealistic to expect significant ammunition resupply to occur. Probably the only resupply would be by air for tactical emergencies.⁸⁷ The obvious solution is to have artillery units increase the size of their basic loads. Just as the AFA units maintained their "rolling reserve" of ammunition, ALBF artillery units will have to increase their ammunition carrying capacity.

Although the use of TGW's may cut consumption by up to 40%, ammunition use will still be high.⁸⁸ A Fort Sill study indicates HIP expenditure rates of 201 rounds per tube per day (RTD) during normal commitment, 387 RTD during surge periods and 599 RTD for peak activity.⁸⁹ Since the current basic load for an M109 Howitzer battalion is only 234 RTD,

it will probably need to be adjusted upward if the HIP battalion is to operate without ammunition resupply in ALBF.⁹⁰ The whole issue of ammunition expenditure clearly warrants further study in view of both the impact of TGW's and the greater role of artillery in the ALBF concept.

The ALBF concept will also change the focus of artillery support within the division. With the brigade as the lowest level of self-sustaining, independent tactical maneuver instead of the division, close support cannon battalions will be more closely wedded to their supported maneuver brigade. If the brigade is to be a true combined arms package able to be plugged in and out of various division bases for mission tailoring, then its DS artillery must go with it. In fact, the ALBF concept says that basically the DS battalion is always with the maneuver brigade.⁹¹

The ALBF concept loosely defines the relationship of the close support artillery to the brigade as "somewhat closer than DS." As defined by current doctrine, the DS role is very decentralized and effectively allows the DIVARTY commander control of the unit in only two areas. First, he may send missions to the unit which are fired as a last priority. Second, he may position the DS battalion when necessary to comply with the higher commander's intent. However, given the increased importance of the close support mission to the brigade, cannon range limitations on the nonlinear battlefield, and the lethality of new munitions

which reduces the need to mass fires, neither of these controls seem relevant.

In fact, the phrase "somewhat closer than DS" seems to be a politically acceptable definition of an organic relationship. It makes little sense to have a tailorable force structure in which the basic building block, the combined arms brigade, is missing its habitually supporting artillery battalion.

Some will argue that placing the close support battalion organic to the brigade will decrease the flexibility of the DIVARTY commander. However, flexibility can also be achieved by placing corps longer range missile and rocket assets under his control. Again, because of range limitations, corps artillery cannon assets will normally be OPCON, DS or reinforcing to the maneuver brigades. In situations when the division is involved in a linear fight, flexibility could be achieved by giving the force artillery commander some limited doctrinal authority which, by exception, would allow him to centralize the fires of the organic battalions when necessary.

Regardless, the habitual relationship fostered by placing the DS battalion within the brigade would assist in developing more maneuver oriented close artillery support to the brigades. Indeed, very agile and responsive artillery will be required to support a brigade movement to contact covering over 100 kilometers a day. Close support fires will be crucial, because although operational fires will not

be decisive, tactical ones may be.⁹²

As we noted earlier, the artillery community is currently not well prepared to deliver such support. In discussing the challenges that ALBF presents, TRADOC Commanding General John W. Foss commented that force agility must be both a force characteristic and a state of mind on the part of commanders.⁹³ Just as the armored artillerymen of World War II developed an aggressive, maneuver oriented state of mind, cannon artillerymen of the future will have to adjust to the new requirements that ALBF will have placed upon them.

Even if the DS battalions are placed organic to the brigades, the DIVARTY headquarters will still play a key role in providing close artillery support. Much as the corps artillery functioned as an allocator of fire support in World War II, the DIVARTY will likewise suballocate FA brigade assets pushed down from corps. The DIVARTY commander will also command those corps firing units temporarily attached to the division and act as the FSCoord to the division commander.

With reinforcing corps assets, DIVARTY will fight the crucial counterfire battle as well as augment the fires of the close support battalions. Once the FIRES phase is over, corps will allocate a portion of its long shooters down to the divisions.⁹⁴ DIVARTY will use these missile systems to continue to strip away the enemy's indirect fire means in order to facilitate destruction of the enemy force by

maneuver. By pushing down corps cannon FA units as well as some missile assets, the DIVARTY commander can weight the main attack and also give the DS battalion commander the flexibility that different systems and munitions offer.

The DIVARTY commander will also have a significant role in peacetime. Even if the close support battalions are organic to the maneuver brigades, the DIVARTY could still function as a central point for training purposes. The current Soviet system provides a good example of this. Within the Soviet division, the Chief of Missile Troops and Artillery (CMTA) is the division commander's fire support advisor, but he commands no troops. However, he does have the authority to inspect divisional artillery units to ensure that they maintain their technical proficiency.⁹⁵ A similar system within the U.S. division would provide a means of maintaining the highly technical skills required of artillerymen. Such a centralized focus would also enhance the capability of the division's artillery to mass in linear situations and would also provide a degree of standardization which will be crucial in a tailorable force.

In the final analysis, whatever organization and doctrine the field artillery finally adopts to support the ALBF concept, it must provide adequate, continuous and flexible fires on the future battlefield. Adequacy of close support is primarily an issue of responsiveness and mass. Our review of history showed that adequate support to deep offensive operations was provided by decentralizing

sufficient artillery assets to achieve responsive massed fires. Such extreme decentralization often resulted in a one to one ratio of artillery to maneuver in the attacking formations. The armored artilleryman of World War II also recognized that adequate close fire support meant that responsive fires were necessary to help defeat enemy armor, suppress, destroy or obscure enemy antitank defenses and provide sufficient firepower to maintain the momentum of the advance.

The need for adequate close support in the form of smoke and suppressive fires exists today and will remain in the context of the ALBF concept. However, as results at NTC have shown, today's DS artilleryman is not as focused on the close support role as necessary. Instead, the centralized nature of the artillery C2 system and his command relationship with the DIVARTY tends to focus him toward centralization. Additionally, we find that current doctrine fails to sufficiently detail how artillery should provide adequate support to deep maneuver operations.

However, new munitions and the challenge of supporting the ALBF concept will redefine adequacy of support. By making the artillery a virtual long range direct fire system, increased lethality will reduce the need for conventional massed fires. Instead, given firepower's greater role on the battlefield, adequacy will be measured more in terms of total volume of fire, its responsiveness, and its synchronization with the scheme of maneuver.

If direct support artillery is to provide adequate support in ALBF, it will have to focus more closely on the combined arms brigade. Strengthening the habitual relationship between artillery and maneuver will enhance the synchronization of combined arms in the fluid and very difficult environment that the ALBF concept projects.

Continuous close support is a function of mobility, range, depth and ammunition supply. Historically, mobility of artillery has been a critical factor in enabling it to keep pace with the maneuver force it supports. For example, in World War II, the M7 105mm howitzer was built on a Sherman tank chassis, giving it the same mobility as the force it supported.

Although the HIP howitzer is a vast improvement over the current M109A3, its limited mobility and range will limit its ability to provide continuous fires on the future battlefield. Since the HIP has a range of only 30 kilometers, maneuver forces could quickly outrun its range fan and be forced to slow their rate of advance.

If history is any indicator, ammunition availability may also be a limiting factor in providing continuous fire support in ALBF. Realistically, the only solution to the ammunition problem in the ALBF scenario is to carry more of it forward initially. However, increasing the artillery logistics tail further degrades force mobility. While the advent of smart munitions will certainly give the artillery a greater payoff per round expended, a mission area analysis

will have to be conducted to determine the degree to which ammunition expenditure will be reduced.

Additionally, the maxim of never keeping artillery in reserve will have to be reviewed in light of the close support requirements of ALBF. It makes sense to keep DS battalions out of the fight until their brigade is committed. Otherwise they may join their brigade in need of ammunition, fuel and maintenance and be less capable of providing continuous support of the attack.

Depth of artillery assets is also crucial if fire support is to be continuous. There must be sufficient artillery available to perform more than one fire support task at a time. If the close support battalion becomes totally dedicated to supporting the maneuver battle, there must be another fire unit available to shoot counterfire, SEAD and interdiction missions. Since these three tasks are all ideal tasks for rocket artillery, the DIVARTY commander should routinely plan to reinforce each brigade with MLRS assets. The ongoing conversion of corps 203mm cannon battalions to MLRS battalions should provide sufficient rocket assets within the corps so that they may be allocated down to the division level.

Survivability of field artillery assets is also necessary if close fire support is to have depth. It is difficult to provide continuous fire support if your artillery is destroyed or is afraid to go forward because of its vulnerability. Cannon artillerymen of the future must

have a better self defense capability if they are to function on a nonlinear battlefield. Developing a 155mm HEAT round or mounting an effective antitank missile on selected battery vehicles would not only give the artillery a self defense capability but would also add depth to the antitank capability of the force as a whole.

Finally, flexibility of the fire support system is crucial to its success in fast moving, fluid operations. Flexibility of fire support is currently a function of maximum feasible centralized control. During World War II, commanders used standard tactical missions to preserve some degree of centralized control until distance made it no longer feasible. Doing this preserved their flexibility to mass fires. However, the ranges involved in ALBF mean that centralized control, at least for limited range cannon artillery, will be largely irrelevant. Flexibility to mass, when necessary, could be achieved by giving the DIVARTY commander some authority, much as the Soviet system does, to send missions to the close support battalions.

Flexibility at the brigade level could be achieved by having the right mix of cannons, rocket artillery, and target acquisition means present in order to make maximum effective use of the indirect fire means available. An assortment of delivery systems and munitions gives the commander the flexibility he needs not only to engage targets effectively but to also react to unforeseen circumstances. Having adequate resources available at the

brigade level would also give the commander the flexibility to subassign missions to his close support battalion batteries.

In summary, providing adequate, continuous, and flexible close artillery support on the ALBF battlefield will necessitate significant changes in both current artillery organization and employment doctrine. The nature of the future battlefield dictates that cannon artillery should be extremely decentralized. Similarly, the capabilities of new munitions mean that close support artillery will be more involved in the scheme of maneuver and that sufficient firepower must be integrated at the brigade level if that unit is to successfully execute independent maneuver. While the current doctrinal fundamentals of organizing artillery for combat will remain applicable to the long range systems of the corps, doctrine will require revision if it is to support the decentralized operations of short range systems in the fast moving nonlinear environment envisioned by ALBF.

CONCLUSIONS AND IMPLICATIONS

It seems plain that future doctrine and organization of the field artillery need to recognize the fundamental changes which the ALBF concept and its associated emerging technologies bring to the battlefield. But just what changes should be made to adapt close support artillery to both the difficult challenges and the new capabilities which

lay ahead in ALBF?

Clearly, the nature of the ALBF concept dictates that the direct support artillery battalion should be fully decentralized and placed organic to the combined arms brigade. Similarly, because of range limitations, corps level cannon battalions will rarely be given anything but direct support or reinforcing missions and will thus also be required to focus almost exclusively on the close support role.

Although the DS battalions may become organic to the brigades, the DIVARTY headquarters should continue to exist as a small C2 headquarters which will have significant responsibilities in both peacetime and in combat. By using a doctrinal approach similar to that of the Soviets, the DIVARTY Commander--perhaps renamed the division Chief of Artillery--would insure the technical proficiency of the close support artillery battalions and administer their specialized training. Making him the intermediate rater for the DS battalion commanders would probably lend sufficient authority to this system.

Target acquisition assets, so crucial to the effective employment of smart munitions, must exist at both the division and brigade level. Placing counterfire radars and UAV's at both levels will not only build in the flexibility necessary to operate on a dispersed and nonlinear battlefield but will also allow the formation of dedicated sensor-shooter groupings similar to the Soviet style

reconnaissance-fire complex.

The perennial problem of artillery ammunition resupply becomes even more important with the increased importance of artillery's role in ALBF. The ammunition haul capability of all short range artillery units will have to be expanded to make them self-sufficient for a certain period of combat. Additionally, doctrine will have to address specific methods of providing emergency resupply to committed artillery units.

Doctrine will also have to deal with the inherent mobility shortcomings of the HIP howitzer. Tactics, techniques, and procedures will have to be developed to maximize the forward movement rate of a HIP unit. It may be that DS artillery units will have to have a head start during a brigade movement to contact.

Likewise, artillery organizations will have to be equipped with a more effective self defense capability if they are to survive on the nonlinear battlefield. Again, new doctrinal tactics and techniques will have to be developed to reflect the increased importance of cannon direct fire both for self defense and for enhanced close support.

The meager doctrinal guidance which now exists for the employment of artillery in deep maneuver operations will have to be significantly expanded and validated. This doctrine should reflect both a new level of force agility and an aggressive and maneuver oriented "state of mind".

Similarly, the realities of the ALBF battlefield will require a revision of the current doctrinal fundamentals of organizing artillery for combat. Because of the decentralization of artillery assets which will occur, the current doctrinal guidelines, which tend toward maximum feasible centralized control, will have to change in order to reflect the way in which artillery will be employed in the future.

Future commanders will be more concerned with organizing their artillery to both accomplish the commander's intent and place the weight of their fire support means against the enemy's most vulnerable area. Flexibility should be built in to insure that each echelon is capable of performing each fire support task. This will be necessary because although fire support planning may be centralized, execution will in the future be decentralized. For the same reason, it will also be important that the proper sensor-shooter links exist at each echelon. Future artillery systems will be more specialized than are current ones, and matching system capabilities to mission requirements will also take on added importance.³⁶

Finally, future doctrine will also have to be modified to recognize the great leap in lethality which precision guided munitions will give the artillery. This significant increase in firepower will enable the artillery to add to its current role of fire support a new role of fire destruction. Given the artillery's future capability to

truly maneuver by fires to destroy point targets at long ranges, doctrine will have to be adjusted to reflect more of a maneuver orientation vis-a-vis one oriented strictly on fire support.

As Giulio Douhet said, "victory always smiled on one who was able to renew traditional forms of warfare, and not on the one who hopelessly tied himself to these forms."³⁷ Although technology may produce only one quarter of the potential weapons enhancements that it promises, changes necessitated by new capabilities are coming and artillerymen need to start thinking about them now. It would indeed be a shame if we instead cling to our traditional forms of warfare and are ill-prepared to exploit our expanded capabilities with a new doctrine on the future battlefield.

APPENDIX A

Field Artillery Tactical Missions

INHERENT RESPONSIBILITIES OF FIELD ARTILLERY MISSIONS

AN FA UNIT WITH A MISSION OF--	DIRECT SUPPORT	REINFORCING	GENERAL SUPPORT REINFORCING	GENERAL SUPPORT
1. Answers calls for fire in priority from--	1. Supported unit 2. Own observers ¹ 3. Force FA HQ	1. Reinforced FA 2. Own observers ¹ 3. Force FA HQ	1. Force FA HQ 2. Reinforced unit 3. Own observers ¹	1. Force FA HQ 2. Own observers ¹
2. Has as its zone of fire--	Zone of action of supported unit	Zone of fire of reinforced FA	Zone of action of supported unit to include zone of fire of reinforced FA unit	Zone of action of supported unit
3. Furnishes fire support team (FIST/FSS) ²	Provides temporary replacements for casualty losses as required	No requirement	No requirement	No requirement
4. Furnishes liaison officer--	No requirement	To reinforced FA unit HQ	To reinforced FA unit HQ	No requirement
5. Establishes communications with--	Company FSOs, FSOs, and supported maneuver unit HQ	Reinforced FA unit HQ	Reinforced FA unit HQ	No requirement
6. Is positioned by--	DS FA unit com- mander or as ordered by force FA HQ	Reinforced FA unit or as ordered by force FA HQ	Force FA HQ or reinforced FA unit if approved by force FA HQ	Force FA HQ
7. Has its fires planned by--	Develops own fire plans	Reinforced FA unit HQ	Force FA HQ	Force FA HQ
¹ Includes all target acquisition means not deployed with supported unit (radar, aerial observers, survey parties, etc.). ² A fire support section (FSS) for each maneuver brigade/battalion/cavalry squadron and one FIST with each maneuver company/ground cavalry troop are trained and deployed by the FA unit authorized these assets by TOE. After deployment, FISTs and FSSs remain with the supported maneuver unit throughout the conflict.				

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